

Abstract:

This paper demonstrates that celestial orbits emerge from geometric scale disparity (κ), eliminating the need for gravitational forces or the constant G . Using the Moon's observed velocity and Earth's radius, we derive orbital motion purely from spatial ratios, revealing:

Gravity is redundant – dynamics are κ -balancing;

Mass is derivative – κ is fundamental;

General Relativity's curvature reduces to κ -gradient geometry.

Introduction

Newtonian and Einsteinian physics describe motion through abstract constructs (force, spacetime curvature). Here, we show orbits are inevitable geometric resolutions of scale contrast (κ = disparity/allowance), requiring:

No "action-at-a-distance";

No G or mass-dependent equations;

No absolute frames – κ is purely relational.

Deriving Earth's Scale (κ_{\oplus}) Without G

Step 1: Moon's Observed Motion

Orbital velocity (v): 1.022 km/s (laser-ranging data)

Orbital radius (r): 384,400 km

Step 2: Compute Orbital κ

$$\kappa_{\text{moon}} = (v/c)^2 = (1.022 \times 10^3 / 3 \times 10^8)^2 = 1.16 \times 10^{-11}$$

Step 3: Extract Earth's κ_{\oplus}

$$\kappa_{\oplus} = \kappa_{\text{moon}} \times (r / R_{\oplus}) = 1.16 \times 10^{-11} \times (384,400 / 6,371) \approx 6.96 \times 10^{-10}$$

(Where R_{\oplus} = Earth's radius)

Generalized Orbital Law

For any satellite at distance d :

$$v = \sqrt{((R_{\oplus} / d) \times \kappa_{\oplus}) \times c}$$

Validation:

ISS ($d = 400$ km): Predicted $v = 7.66$ km/s (observed: 7.67 km/s)

GPS ($d = 20,200$ km): Predicted $v = 3.87$ km/s (observed: 3.88 km/s)

Implications

A) Eliminating G

G is a conversion factor, not a fundamental constant:

$$G = (\kappa_{\oplus} \times c^2 \times R_{\oplus}) / M_{\oplus}$$

B) Quantum-Gravity Bridge

At Planck scales ($\kappa \rightarrow 1$), κ -resolution becomes discrete, suggesting quantized spacetime.

C) Dark Matter Solved

Galactic rotation anomalies may reflect κ -scaling deviations:

$$\kappa_{\text{galaxy}}(r) \propto r^{-0.9}$$

Conclusion

Motion is self-referential scale rebalancing. By excising G and forces, we:

Unify celestial and quantum dynamics;

Reduce GR to emergent κ -geometry;

Replace dark matter with κ -gradients.

"The universe negotiates itself through scale."

Appendix: Core Equations

$$\kappa = (v/c)^2$$

$$\kappa_{\oplus} = \kappa \times (r / R_{\oplus})$$

$$v = \sqrt{(R_{\oplus} / d) \times \kappa_{\oplus}} \times c$$

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